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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,157	11/25/2003	Shuzo Iwashita	81863.0024	7015

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EXAMINER	
LOPEZ, CARLOS N	

ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/722,157	IWASHITA ET AL.	
	Examiner	Art Unit	
	Carlos Lopez	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-13 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13* is/are allowed.

6)☒ Claim(s) *6-12 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6-11 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Kimura (US 5,504,388). Kimura discloses a method of making piezoelectric ceramics. The method comprises piezoelectric material layer 14 interposed between support members 12 and 16 (Col. 6, lines 50ff and see example 2 showing the firing of the piezoelectric material layer 14 while in contact with the support member). The claimed flatness is disclosed in Col. 3, lines 62ff and the claimed porosity is disclosed in Col. 5, lines 55ff.

As for claims 9-10, Col. 7, lines 43ff discloses a piezoelectric ceramic comprised of crystal phase zirconia, niobium, and lead based structure.

Regarding claim 11, Col. 5, lines 12ff discloses an average particle size of 0.1-8 μm.

Regarding claim 31, Col. 7, lines 64ff discloses that the support members undergo suitable heat treatment or firing operation and thus will be sintered. Hence, the supporting member is a sintered body.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (US 5,504,388). Kimura is silent disclosing the use of CaO, MgO, or Y_2O_3. However, at column 7, lines 45ff Kimura teaches that CaO, MgO, or Y_2O_3 may be added to a ceramic substrate in order to reduce thermal stress during heat treatment of the piezoelectric ceramic composite. Hence the disclosure by Kimura teaches that CaO, MgO, or Y_2O_3 reduces thermal stress. At the time the invention was made it would have been obvious to a person of ordinary skill in the art to have used CaO, MgO, or Y_2O_3 in the piezoelectric ceramic in order to reduce thermal stress, as taught by Kimura. The claimed limitation of adding CaO, MgO, or Y_2O_3 to piezoelectric ceramic is a deduction clearly envisaged by Kimura, that a person of ordinary skill would arrive in order to provide a piezoelectric ceramic with reduced thermal stress when firing of the green composite, without any unexpected results and reasonable expectation of success.

Regarding claim 12, Kimura discloses a film containing lead zirconate titanate (PZT) (Col. 6, lines 59-62) and while Kimura is silent firing in a sealed space, Kimura does teach in Col. 7, lines 5-63 that it is important to avoid addition of any materials that will react with the piezoelectric material and cause undesirable variations. Hence, it is

expected to fire the green compact containing piezoelectric ceramic powder while being inserted into a sealed space in order to avoid contamination.

Allowable Subject Matter

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art does not disclose a method of manufacturing piezoelectric ceramics that comprises of firing a green compact in a sealed space that satisfies the volume relations represented by the expressions (1) and (2) in claim 13.

Response to Arguments

Applicant's arguments filed June 7, 2006 have been fully considered but they are not persuasive.

In response to the applicant's argument that the piezoelectric/electrostrictive film and the electrode films are integrated and not separated for use in Kimura, Kimura only claims in that the piezoelectric/electrostrictive film and the electrode films undergo heat-treatment (Col. 12, claim 17). The claims do not limit Kimura in forming an integration of piezoelectric/electrostrictive film and electrode films.

In response to the applicant's argument that the piezoelectric ceramics are separated from the supporting member in the present invention, such a limitation is not

recited in the claims. The phrase "disposed on" does not mean that it is separated. There is no indication in the claims or specifications that the piezoelectric ceramics are separated from the supporting member.

In response to the applicant's argument that the supporting member has a smaller porosity in the present invention than the porosity disclosed by Kimura, it should be noted that a porosity of 5% or less is within the range disclosed by Kimura (2-15%) in Col. 5, lines 49-60.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Lopez whose telephone number is 571.272.1193. The examiner can normally be reached on Mon.-Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571.272.1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CL

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